

Hanford Tank Cleanup Update

April 2010

Use of a larger access pipe, or riser, (being tested below) will help speed single-shell tank retrievals starting with tank C-107.



A mock-up tank is used to test cutting technologies.

Washington River Protection Solutions (WRPS), a company owned by URS Corporation and EnergySolutions, is responsible for reducing the risk from Hanford tank waste to the Columbia River, its employees and the public. Working for the U.S. Department of Energy's Office of River Protection, WRPS is charged with safely managing this waste until it is prepared for disposal.

Focus continues on waste retrieval

Retrievals begin on C-104

Removal of waste from another of Hanford's aging, leak-prone single-shell tanks is under way, with the waste being transferred to newer, safer double-shell tanks where it will be safely stored until it is prepared for disposal.

Tank C-104 is the 12th single-shell tank to undergo waste removal. The 530,000-gallon tank is one of 16 tanks located in an area known as C Farm near the center of the Hanford Site. At the time waste removal began it held 260,000 gallons, which is more than any of the 149 single-shell tanks at Hanford.

As retrieval from C-104 moves forward, infrastructure installation for the start of retrieval from nearby tank C-111 is also under way. Retrieval from C-111 is scheduled to begin this summer. Design work for retrieval from additional tanks is also moving forward.

The goal of the waste retrieval program is to remove at least 99 percent of the waste to meet the criteria established by the Tri-Party Agreement (TPA) that governs Hanford cleanup.

Preparing For MARS

Installation of a remote-control hydraulic arm known as the Mobile Arm Retrieval System (MARS) into single-shell tank C-107 is another step closer. WRPS has completed initial testing of the cutting system that will be used to install a new access pipe in the top of the tank. MARS is a robust robotic arm that will significantly improve the ability to retrieve waste from single-shell tanks and transfer it to newer, safer, double-shell tanks. But MARS won't fit into existing access pipes, so a new opening must be cut in the top of the tank to accommodate it.

The cutting system uses high-pressure water laded with a fine grit that cuts its way through the concrete and steel. Even though this technology is commonly used in industry there were important questions to answer before cutting into a radioactive waste tank. Determining how much water the cutting process will add to the tank, how much grit material will be used, and development of new procedures are all important issues to understand and resolve, not to mention the appropriate level of worker protection that will be required.

Liquids removed from 244-CR Vault

Nearly 16,000 gallons of contaminated liquids have been removed from cells within a facility known as the 244-CR Vault. The vault is located inside C Tank Farm near the center of the Hanford Site. The liquids were pumped into nearby single-shell tank C-104 and transferred to safer double-shell tank storage along with the C-104 waste that is currently being retrieved.

The vault was built in 1952 to support the uranium metal recovery program during the Cold War era. It was last used in 1995 during tank waste retrieval activities in C Farm.

Each of the four cells in the vault contains tanks and the tanks hold waste that must be monitored. It is assumed that the liquid is the result of rain and snow melt seeping into the cells that have mixed with trace amounts of tank waste. With the liquids now gone, Tank Operations personnel will be able to monitor the vault to verify that tank waste hasn't leaked into the surrounding cells.



C-111 infrastructure work



C-107 cutting system testing



244-CR Vault walkdown

New actions to improve safety for tank farm workers

WRPS institutes chemical ALARA program

The concept of ALARA – As Low As Reasonably Achievable – has long been applied to radiological protection at Hanford and throughout the Department of Energy complex. Now the same principles are being applied to minimizing exposure to chemical vapors coming from Hanford's underground waste storage tanks.

Like radiation, chemical vapors are part of the job. To minimize exposure, WRPS has made a number of changes in tank farm operations. The workplace monitoring program has also been enhanced with additional technicians and new monitoring instruments, and a number of other changes are being evaluated.

ALARA principles are a cost-effective and common sense approach to reducing general exposure to chemical vapors. By applying these principles to planning and implementing work in the tank farms, chemical exposures can be reduced.



WRPS supports our community

A boost for local education

Placing a high priority on education, WRPS has donated \$500,000 to benefit local higher education programs. The funds will help support science, technology, engineering and mathematics efforts at Washington State University Tri-Cities and Columbia Basin College.

Quality higher education opportunities, especially in technical fields like science and engineering are critical to the success of the company's environmental cleanup mission and the community's overall economic health and vitality. The investments provide scholarships, undergraduate research opportunities, internships, and teaching laboratory development.

Demand for technically trained personnel will grow in the years ahead, and WRPS is committed to working with both institutions on ways to best help meet the need.



Local small businesses benefit from WRPS subcontracts

Washington River Protection Solutions awarded nearly \$37 million in subcontracts to local small businesses in Benton, Franklin and Yakima counties in fiscal year 2009 and has already exceeded that amount in FY10. In the first six months of this fiscal year we have already awarded \$46 million to local small business.

The largest portion of this money has been spent purchasing engineering services to support the waste tank cleanup activities. A smaller portion has been spent to obtain waste retrieval technologies, construction activities and other work.

In addition to the purchase of services, more than one million dollars has been spent with local businesses to purchase materials ranging from office supplies, to laboratory supplies to hardware used in the field.

Recovery Act funding advances work at tank farms



Cleanout box removal

The \$326 million in Recovery Act funding gives Washington River Protection Solutions the opportunity to accelerate work in fiscal years 2009, 2010 and 2011 to reduce the risk posed by Hanford's high-level tank waste and to prepare for Waste Treatment Plant operations.

WRPS is using the Recovery Act funding to improve the tank farm infrastructure and make preparations to feed and eventually operate the Waste Treatment Plant, which is the cornerstone of the Hanford cleanup mission.

Hanford cleanout boxes get the boot

American Recovery and Reinvestment Act funding has been used to remove three underground non-compliant waste transfer line cleanout boxes, or COBs, from a Hanford tank farm.

The COBs were similar to cleanout lines in a sewer system. They provided an opening into the waste transfer lines so the lines could be cleaned out. The boxes did not meet current environmental requirements so the access pipes were capped and the boxes were removed. Crews will still be able to clean the lines by using underground utility boxes called valve pits.

Workers used special equipment when removing the boxes to ensure no liquids or flammable gases escaped. They also used protective bags to cut and remove the COBs and associated drain lines. The project was completed several weeks ahead of schedule.

Upgrade to 242-A Evaporator raw water system complete

Crews have finished work on the raw water service building at the aging 242-A Evaporator completing a major upgrade to one of the facility's essential components. The project was funded with money provided by the American Recovery and Reinvestment Act.

The 242-A Evaporator is a critical link in the waste transfer chain and supports the cleanup mission by increasing storage space in the double-shell tanks. Liquid waste is heated under vacuum, excess water is removed, and the concentrated waste is returned to the double-shell tanks. The raw water service building provides the evaporator with an average of 2,500 gallons of water per minute, which is needed to cool equipment and condense the water vapors during processing.

The 33-year-old evaporator was originally expected to operate for about a decade. This upgrade is expected to keep the facility operational for another 40 years. The evaporator is scheduled to restart in the near future.



242-A Evaporator raw water system upgrade

Improved filters installed on tank risers in Hanford tank farm

Improved filters have been installed on six single-shell tank risers at Hanford. The filters fit over the open end of a pipe running from the underground tanks to the surface, allowing the tanks to "breathe." The filters trap any stray particles of contamination that could escape into the air and are a significant improvement over the filters used in the tank farms for the past 40 years. The filters are being replaced with funding provided by the Recovery Act.

The new filter design reduces radiation exposure to workers because they are smaller, lighter, and easier to handle. It used to take up to 12 people using heavy equipment to install and perform annual testing of the older filters. Now the work can be done by just three people. Each of the new filter assemblies weighs between 40 and 50 pounds, compared to the old filters which weighed 500 pounds. The lighter equipment decreases the risk of worker injury.

The filters are also less expensive to purchase and maintain. The average annual maintenance cost is expected to drop from \$3,500 per filter to only \$800 per filter. Workers will install about 114 radial filters in the tank farms for an estimated annual savings of more than \$300,000.